SD8n

8-Port NWay 10/100Mbps Fast Ethernet Switch

User's Guide

Version 1.0
P/N: ATSD8-9904 Rev.A

This User's Guide contains important information regarding the installation of your 10/100Mbps Switch. Please read it completely before attempting to install your Network switch.

For future reference, record the serial number of your network switch in the space below:

SERIAL Number _____

The serial number is located on the bottom of the switch.

Amer.com **7259 Bryan Dairy Road, Largo, FL 33777.**

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Facsimile	(727) 540-0405

Service Center
Amer.com
7259 Bryan Dairy Road
Largo, FL 33777
U.S.A.

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ABOUT THIS GUIDE

Congratulations on your purchase of the SD8n Fast Ethernet 8-port 10/100M NWay Switch. This device integrates 100Mbps Fast Ethernet and 10Mbps Ethernet network capabilities in a highly flexible desktop package.

Purpose

This manual discusses how to install your SD8n Fast Ethernet 8-port 10/100M NWay Switch.

Terms/Usage

In this guide, the term **Switch** (first letter upper case) refers to your SD8n Fast Ethernet 8-port 10/100M NWay Switch, and **switch** (first letter lower case) refers to other Ethernet switches.

Overview of this User's Guide

Chapter 1, *Introduction*. Describes the Switch and its features.

Chapter 2, *Unpacking and Setup*. Helps you get started with the basic installation of the Switch.

Chapter 3, *Identifying External Components*. Describes the front panel, rear panel and LED indicators of the Switch.

Chapter 4, *Connecting the Switch*. Tells how you can connect the Switch to your Ethernet network.

Appendix A, *Technical Specifications*. Lists the technical (general, physical and environmental, and performance) specifications of the Switch.

Appendix B, *RJ-45 Pin Specification*. Describes the RJ-45 receptacle/connector and the straight and crossover cable connector.

INTRODUCTION

This chapter describes the features of the Switch and some background information about Ethernet/Fast Ethernet switching technology.

Fast Ethernet Technology

The growing importance of LANs and the increasing complexity of desktop computing applications are fueling the need for high performance networks. A number of high-speed LAN technologies have been proposed to provide greater bandwidth and improve client/server response times. Among them, 100BASE-T (Fast Ethernet) provides a non-disruptive, smooth evolution from the current 10BASE-T technology. The non-disruptive and smooth evolution nature, and the dominating potential market base, virtually guarantee cost effective and high performance Fast Ethernet solutions in the years to come.

100Mbps Fast Ethernet is a new standard specified by the IEEE 802.3 LAN committee. It is an extension of the 10Mbps Ethernet standard with the ability to transmit and receive data at 100Mbps, while maintaining the CSMA/CD Ethernet protocol. Since the 100Mbps Fast Ethernet is compatible with all

other 10Mbps Ethernet environments, it provides a straightforward upgrade and takes advantage of the existing investment in hardware, software, and personnel training.

Switching Technology

Another approach to pushing beyond the limits of Ethernet technology is the development of switching technology. A switch bridges Ethernet packets at the MAC address level of the Ethernet protocol transmitting among connected Ethernet or Fast Ethernet LAN segments.

Switching is a cost-effective way of increasing the total network capacity available to users on a local area network. A switch increases capacity and decreases network loading by dividing a local area network into different *segments*, which don t compete with each other for network transmission capacity.

The switch acts as a high-speed selective bridge between the individual segments. The switch, without interfering with any other segments, automatically forwards traffic that needs to go from one segment to another. By doing this the total network capacity is multiplied, while still maintaining the same network cabling and adapter cards.

For Fast Ethernet networks, a switch is an effective way of eliminating problems of chaining hubs beyond the two-repeater limit. A switch can be used to split parts of the network into different collision domains, making it possible to expand your Fast Ethernet network beyond the 205-meter network diameter limit for 100BASE-TX networks. Switches supporting both traditional 10Mbps Ethernet and 100Mbps Fast Ethernet are also ideal for bridging between the existing 10Mbps networks and the new 100Mbps networks.

Switching LAN technology is a marked improvement over the previous generation of network bridges, which were characterized by higher latencies. Routers have also been used to segment local area networks, but the cost of a router, the setup and maintenance required make routers relatively impractical. Today switches are an ideal solution to most kinds of local area network congestion problems.

Features

The Switches were designed for easy installation and high performance in an environment where traffic on the network and the number of users increase continuously.

The Switches with their small, compact size were specifically designed for small to middle range workgroups. These Switches can be installed where space is limited; moreover, they provide immediate access to a rapidly growing network through a wide range of user-reliable functions.

The Switches are ideal for deployment with multiple high-speed servers for shared bandwidth 10Mbps or 100Mbps workgroups. With the highest bandwidth 200Mbps (100Mbps full-duplex mode), any port can provide workstations with a congestion-free data pipe for simultaneous access to the server.

The Switches are expandable by cascading two or more switches together. As all ports support 200Mbps, the Switches can be cascaded from any port and to any number of switches.

The Switches are a perfect choice for site planning to upgrade to Fast Ethernet in the future. Ethernet

workgroups can connect to the Switches now, and change adapters and hubs anytime later without needing to change the Switches or reconfigure the network.

The Switches combine dynamic memory allocation with store-and-forward switching to ensure that the buffer is effectively allocated for each port, while controlling the data flow between the transmit and receive nodes to guarantee against all possible packet loss.

The Switches are an unmanaged 10/100 Fast Ethernet Switch that offers solutions in accelerating small Ethernet workgroup bandwidth. Other key features are:

Uplink/ MDI-II (media dependent interface) port for uplink to another switch, hub or repeater.

Store and forward switching scheme capability. As the result of complete frame checking and error frame filtering, this scheme prevents error packages from transmitting among segments.

NWay Auto-negotiation for any port. This allows for auto-sensing of speed (10/100Mbps) thereby providing you with automatic and flexible solutions for your network connections.

Flow control for any port. This minimizes dropped packets by sending out collision signals when the port s receiving buffer is full. Note that flow control is only available in half duplex mode.

Data forwarding rate per port is at wire-speed for 100Mbps speed.

Data forwarding rate per port is at wire-speed for 10Mbps speed.

Data filtering rate eliminates all error packets, runts, etc., per port at wire-speed for 100Mbps speed.

Data filtering rate eliminates all error packets, runts, etc., per port at wire-speed for 10Mbps speed.

Up to 8K active MAC address entry table per port with self-learning and table-aging for 8-port model.

512 KB RAM buffer per device for 8-port model.

UNPACKING AND SETUP

This chapter provides unpacking and setup information for the Switch.

Unpacking

Open the shipping carton of the Switch and carefully unpack its contents. The carton should contain the following items:

One 8-port 10/100M NWay Fast Ethernet Switch

One external power adapter

This User s Guide

If any item is found missing or damaged, please contact your dealer for replacement.

Setup

The setup of the Switch can be performed using the following steps:

The surface (e.g. table top) must support at least 1.5 kg for the Switch s weight.

The power outlet should be within 1.82 meters (6 feet) of the Switch.

Visually inspect the DC power jack and make sure that it is fully secured to the power adapter.

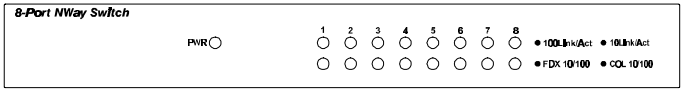
Make sure that there is proper heat dissipation and adequate ventilation around the Switch. Do not place heavy objects on the Switch.

IDENTIFYING EXTERNAL COMPONENTS

This section identifies all the major external components of the hub. Both the front and rear panels are shown, followed by a description of each panel feature. The indicator panel is described in detail in the next chapter.

Front Panel

The figure below shows the front panel of the switch.

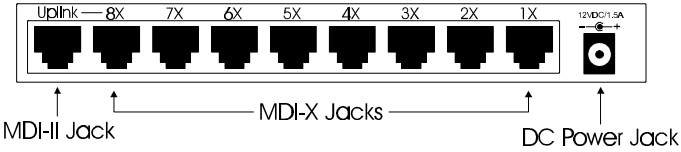


8-port Fast Ethernet 10/100M NWay Switch

LED Indicator Panel

Refer to the LED Indicator section for detailed information about each of the hub s LED indicators.

Rear Panel



8-port Fast Ethernet 10/100M NWay Switch

DC Power Jack: Power is supplied through an external AC power adapter. Check the technical specification section for information about the AC power input voltage.

Since the switch does not include a power switch, plugging its power adapter into a power outlet will immediately power it on.

MDI-X Jacks: Use these jacks to connect stations to the hub. These are **MDI-X** (Medium-Dependent Interface, Cross-wired) jacks, which mean, you can use ordinary straight-through twisted-pair cables to connect user machines and servers to the hub through them. If you need to connect another device with an **MDI-X** jack, such as another hub or an Ethernet switch, you should use a crossover cable, or make the connection using the **MDI-X** jack (described below). For more information about crossover connections.

Uplink Jack(s) (MDI-II): Use this jack to connect stations to the hub. This is MDI-**II** (Medium-dependent Interface, straight-wired) jack, which means you can connect the hub to a device with a MDI-**X** port using an ordinary straight-through cable, making a crossover cable unnecessary.

LED Indicators

Power Indicator (PWR)

This indicator lights green when the hub is receiving power, otherwise, it is off.

Full/Half Duplex, 10/100M Collision
(FDX10/100***(green)***, COLL 10/100***(amber)***)

This LED indicator lights green when a respective port is in full duplex (FDX) mode. Otherwise, it is OFF for half duplex (HDX) operation. It will blink amber when collisions are occurring on the respective port.

100M Link/Activity, 10M Link/Activity
(100M LINK/ACT***(green)***, 10LINK/ACT***(amber)***)

This indicator lights green when the port is connected to a 100Mbps Fast Ethernet station. It also blinks green when transmitting or receiving data on the 100Mbps network. Otherwise, if the indicator lights amber, then the port is connected to a 10Mbps Ethernet station, and blinks amber when transmitting or receiving data on the 10Mbps network.

No light represents no connection.

CONNECTING THE SWITCH

This chapter describes how to connect the Switch to your Fast Ethernet network. In each of the following figures, the 8-port 10/100M NWay Fast Ethernet Switch is shown.

PC to Switch

A PC can be connected to the Switch via a two-pair Category 3, 4, 5 UTP/STP straight cable (Cat.5 must be used for 100Mbps). The PC (equipped with a RJ-45 10/100Mbps phone jack) should be connected to any of the 8 ports (1x - 8x) of the 8-port Switch.

The LED indicators for the PC connection are dependent on the LAN card capabilities. If LED indicators are not lit after making a proper connection, check the PC LAN card, the cable, the Switch conditions and connections.

The following are LED indicator possibilities for a PC to Switch connection:

1. The 100LINK/ACT, 10LINK/ACT LED indicator lights green for hookup to 100Mbps speed or lights amber for hookup to 10Mbps

speed.

2. The FDX 10/100, COLL 10/100 LED indicator depends upon LAN card capabilities for full-duplex or half-duplex.

Hub to Switch

A hub (10 or 100BASE-TX) can be connected to the Switch via a two-pair Category 3, 4, 5 UTP/STP straight cable (Cat.5 must be used for 100Mbps). The connection is accomplished from the hub uplink (MDI-II) port to any of the Switch (MDI-X) ports: 1x - 8x for the 8-port 10/100 Fast Ethernet Switch.

A. 10BASE-T Hub

For a 10BASE-T hub, the Switch LED indicators should light up as the following:

1. FDX 10/100, COLL 10/100 LED indicator is *OFF*.

2. 100LINK/ACT, 10LINK/ACT LED indicator is lit amber.

B. 100BASE-TX Hub

For a 100BASE-TX hub, the Switch LED indicators

should light up as the following:

1. FDX 10/100, COLL 10/100 LED indicator is *OFF*.
2. 100LINK/ACT, 10LINK/ACT LED indicator is lit green.

Hub without Uplink (MDI-II) port

If a hub is not equipped with an uplink (MDI-II) port, connection can be made using either straight cable or crossover cable.

A. Using straight cable

When using straight cable, the connection can be made from the uplink (MDI-II) port of the Switch to any port of the Hub.

B. Using crossover cable

When using crossover cable, the connection can be made from any ports of the Switch to any port of the Hub.

Switch to Switch (other devices)

The Switch can be connected to another switch or other devices (routers, bridges, etc.) via a two-pair

Category 3, 4, 5 UTP/STP straight or crossover cable (Cat.5 must be used for 100Mbps).

A. Using straight cable

When using straight cable, this is done from the uplink (MDI-II) port of the Switch (Switch A) to any of the 10Mbps or 100Mbps (MDI-X) ports of the other switch (switch B) or other devices.

B. Using crossover cable

When using crossover cable, this is done from any (MDI-X) port of the Switch (Switch A) to any of the 10Mbps, 100Mbps (MDI-X) ports of the other switch (switch B) or other device.

1. The 100LINK/ACT, 10LINK/ACT LED indicator lights green for hookup to 100Mbps speed or lights amber for hookup to 10Mbps speed.
2. The FDX 10/100, COLL 10/100 LED indicator depends upon LAN card capabilities for full-duplex or half-duplex

Port Speed & Duplex Mode

After plugging the selected cable to a specific port, the system uses auto-negotiation to determine the

transmission mode for any new twisted-pair connection:

If the attached device does not support auto-negotiation or has auto-negotiation disabled, an auto-sensing process is initiated to select the speed and set the duplex mode to **half-duplex**.

TECHNICAL SPECIFICATIONS

General	
Standards	IEEE 802.3 10Base-T Ethernet IEEE 802.3u 100 Base-TX Fast Ethernet ANSI/IEEE Std 802.3 NWay auto-negotiation
Protocol	CSMA/CD
Data Transfer Rate	Ethernet: 10Mbps (half duplex), 20Mbps (full duplex) Fast Ethernet: 100Mbps (half duplex), 200Mbps (full duplex)
Topology	Star

General	
Network Cables	10BASET: 2-pair UTP Cat. 3,4,5 (100 m), EIA/TIA-568 100-ohm STP (100 m) 100BASE-TX: 2-pair UTP Cat. 5 (100 m), EIA/TIA-568 100-ohm STP (100 m)
Number of Ports	8-port: 8 x 10/100Mbps ports
Uplink Port	MDI-II RJ-45 shared with port * 1

Physical and Environmental	
DC inputs	DC12V/1.5A
Power Consumption	18 watt. (max.)
Temperature	Operating: 0° ~ 50° C, Storage: -10° ~ 70° C
Humidity	Operating: 10% ~ 90%, Storage: 5% ~ 90%
Dimensions	171 x 98 x 29 mm (W x H x D)
EMI:	FCC Class B, CE Mark B, VCCI-II
Performance	
Transmissi Method:	Store-and-forward
RAM Buffer:	8-port: 512Kbytes per device
Filtering Address Table:	8-port: Up to 8K entries per device
Packet Filtering/For warding Rate:	10Mbps Ethernet: 14,880/pps 100Mbps Fast Ethernet: 148,800/pps
MAC Address Learning:	Automatic update

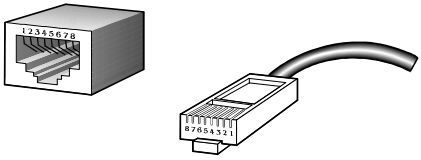
RJ-45 PIN SPECIFICATION

When connecting your 8-port 10/100M NWay Fast Ethernet Switch to another switch, a bridge or a hub, a modified crossover cable is necessary. Please review these products for matching cable pin assignment.

The following diagram and tables show the standard RJ-45 receptacle/connector and their pin assignments for the switch-to-network adapter card connection, and the straight / crossover cable for the Switch-to-switch/hub/bridge connection.

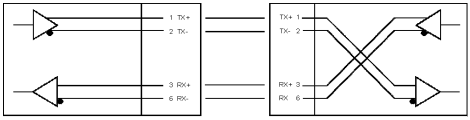
RJ-45 Connector pin assignment	
Contact	Media Direct Interface Signal
1	TX + (transmit)
2	TX - (transmit)
3	Rx + (receive)
4	Not used
5	Not used
6	Rx - (receive)
7	Not used
8	Not used

The standard cable, RJ-45 pin assignment

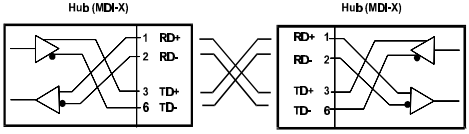


The standard RJ-45 receptacle/connector

The following shows straight cable and crossover cable connection:



Straight cable for Switch (uplink MDI-II port) to switch/Hub or other devices connection



Crossover cable for Switch (MDI-X port) to switch/hub or other network devices (MDI-X port) connection